

working and coupes for exploitation, exclusions are made, from the total areas of blocks, of the portions of the latter where great height and the rugged character of the hills render the forests practically unworkable, since forest growth upon steep slopes high up and upon scarps, &c., has to be preserved for climatic and mechanical purposes.

74. Satisfactory progress was made towards the erection of forest boundary-marks by the Working Plans Division in the Thána District during the year. With the exception of a few outlying forests of small area, the boundaries of all the reserved forests in Khálápúr and Karjat Tálukás were properly defined upon the ground, by erecting 1,586 cairns at a cost of Rs. 970 in time to allow the Forest Survey Party to fix the position of each cairn. And 221 marks were erected in Bassein Range at a cost of Rs. 176. Ninety-five miles of outer forest boundary line were thus defined upon the ground by erecting in all 1,807 cairns at a cost of Rs. 1,146.

75. The average cost of laying out a single compartment, exclusive of the pay of the field establishment, was Rs. 4-12-8 against Rs. 5-13-0 in the preceding year, and the average cost per acre was Re. 0-1-8.

76. Mr. Fry, as usual, delivered lectures on Forestry at the College of Science, Poona, for the students of the Forest class during the rains, and on his departure on leave Mr. Wroughton carried on the duty and conducted the final examination also. Works, such as drawing and colouring in forest boundaries on maps of various scales, the revision of the work done during the season, preparation of block maps, &c., were in progress during the rainy season.

77. The expenditure under *A VIII c.* "Surveys and Working Plans" amounted during the year to Rs. 65,787-2-8, including the cost of Forest Surveys by the Topographical Survey Party of the Government of India, which amounts to Rs. 43,224.

CHAPTER III.

PROTECTION AND IMPROVEMENT.

1.—ESTABLISHMENTS.

78. There was no change during the year in the superior Forest staff allotted to the Northern Circle for the administration of the forests in 12 divisions composing the Northern Circle, which consisted of one Conservator of Forests, and thirteen Deputy and Assistant Conservators of Forests, as in the year before.

79. Messrs. W. S. Hexton and F. R. Desái, Deputy Conservators of Forests, 1st Grade, have been transferred from Sind to the Northern Circle. The following officers belonging to the superior staff were absent on privilege leave for the period stated against their names :—

- (1) Mr. W. G. Betham, Deputy Conservator of Forests, 2nd Grade, from 5th April to 10th July 1888 ;
- (2) Mr. H. Mainwaring, Deputy Conservator of Forests, 3rd Grade, from 2nd May to 1st August 1888 ;
- (3) Mr. H. W. Key's, Assistant Conservator of Forests, 1st Grade, from 9th July to 9th October 1888 ;
- (4) Mr. T. B. Fry, Deputy Conservator of Forests, 3rd Grade, from 6th August to 6th November 1888 ;
- (5) Mr. W. S. Hexton, Deputy Conservator of Forests, 1st Grade, from 5th September to 5th October 1888 ;

and Mr. F. Gleadow, Deputy Conservator of Forests, 4th Grade, proceeded on furlough for 18 months on the 15th April 1888.

80. The services of Mr. Hornidge, Assistant Conservator of Forests, 1st Grade, were placed at the disposal of the Government of India for employment in the Central Provinces under orders contained in Government Resolution No. 2022, dated 14th March 1889.

81. There are 7 appointments of the class Sub-Assistant Conservators of Forests, allotted to the Northern Circle, and they have all been occupied throughout the year. Mr. Náráyan Ballál Oke, Sub-Assistant Conservator of Forests, 1st Grade, proceeded on privilege leave for one month on the 5th December 1888, and having been declared by medical authority to be unfit for further service under Government, his privilege leave was commuted into sick leave, and he finally retired on pension from 7th January 1889.

82. Mr. Ganesh Krishna Sháháne, Sub-Assistant Conservator of Forests, 2nd Grade, was on sick leave from the commencement of the year up to 11th June 1888, and was under suspension from 2nd November 1888 up to the close of the year on several charges of misconduct, of gross neglect of duty, of absenting himself from his charge without leave, and of insubordination, &c., which were brought against him by the Divisional Forest Officer, West Khándesh.

83. The numerical strength and constitution of the Subordinate Forest Protective Establishment has remained unchanged during the year; their monthly cost amounts to Rs. 21,503, and their distribution among the different divisions of the Northern Circle is given in the following statement:—

No.	Forest Division.	Number of Rangers.	RANGE FOREST OFFICERS.						FOREST GUARDS.						REMARKS.	
			Rangers.				Foresters.									
			Rupees 100.	Rupees 80.	Rupees 60.	Rupees 50.	Rupees 40.	Rupees 30.	Rupees 20.	Rupees 15.	Rupees 12.	Rupees 10.	Rupees 9.	Rupees 8.		Rupees 7.
1	North Thána	6	3	4	6	12	20	30	30	6	14	25	25	70	80	The pay of the Rangers and Foresters is personal and the men are transferred from one range to another as the exigencies of the service may require. Therefore the number of appointments in each grade is shown in lump for the whole Circle.
2	South Thána	8								8	14	25	23	70	115	
3	East Khándesh	13								8	16	20	20	49	75	
4	West Khándesh	10								7	14	18	18	50	102	
5	Násik	14								10	20	25	28	50	158	
6	Ahmednagar	11								6	12	22	22	50	85	
7	Poona	11								9	17	26	25	60	120	
8	Sátára	14								9	18	24	22	57	102	
9	Sholapur	7								3	6	11	8	16	63	
10	Surat	6								2	4	4	6	18	27	
11	Panch Maháls	5								2	5	10	10	80	48	
Total		105	3	4	6	12	20	30	30	70	140	210	205	511	990	

84. The temporary protective establishment which was in entertainment, last year, in the Poona and Násik Divisions to strengthen the permanent staff for the proper conservancy of the forests, continued at the same strength during the year:—

No.	Division.	FOREST GUARDS.		
		Rs. 8.	Rs. 7.	Total.
1	Poona	15	30	45
2	Násik	3	3	6
	Total	18	33	51

85. All the Divisional Forest Officers in the Northern Circle complain that conservancy and works in their respective divisions suffer owing to the numerical insufficiency of forest guards, and of higher class subordinate officers to supervise and direct the beat-guards, and to act as overseers on works, and that the revenues derived from the forests would be greater if the forests were to be more closely protected, and worked more up to their capabilities, which can only be done by the agency of increased establishments together with the curtailment of privileges.

86. The very extensive privileges conceded to, and exercised by, forest villagers in all divisions add to the difficulties of protection, for people come and go into the forests at all times with cutting implements and with fire, and their operations are under no proper control; they cut and take, they set fire to forests and disappear. In paragraphs 76 to 90 of the report of last year the insufficiency

of establishments, and the defects in the constitution of existing establishments have been noted, and propositions have been submitted to Government during the year for a complete re-organization of the subordinate Forest staff.

87. There was no change in the strength and constitution of office establishment during the year. The following table will show the sanctioned complement for the several divisions and their monthly cost:—

No.	Division.	NUMBER AND GRADATION.											Monthly Cost.
		Clerks.								Peons.			
		Rs. 100	Rs. 80	Rs. 60	Rs. 50	Rs. 40	Rs. 30	Rs. 20	Rs. 15	Rs. 10	Rs. 9	Rs. 8	
1	Direction ...	1	1	1	2	2	2	2	...	1	1	5	Rs. 579
2	North Thána ...	...	...	...	1	1	1	1	2	...	1	3	203
3	South Thána ...	...	...	...	1	1	1	1	2	...	1	3	203
4	East Khándesh ...	...	...	...	1	...	1	2	2	...	1	3	183
5	West Khándesh ...	...	...	...	1	...	1	2	2	...	1	3	183
6	Násik ...	...	...	...	1	...	1	2	2	...	1	3	183
7	Ahmednagar ...	...	...	...	...	1	1	2	2	...	1	3	173
8	Poona ...	...	...	...	1	...	1	2	2	...	1	3	183
9	Sátára ...	...	...	...	1	...	1	2	2	...	1	3	183
10	Sholápur ...	...	...	...	...	1	1	2	1	...	1	3	158
11	Surat ...	...	...	...	1	...	1	2	2	...	1	3	183
12	Panch Maháls ...	...	...	...	...	1	1	2	1	...	1	3	158
13	7 Sub-Assistant Conservators' offices ...	...	...	...	...	...	...	...	7	...	...	14	217
	Total ...	1	1	1	10	7	13	22	27	1	12	52	2,789

88. The total expenditure incurred upon Forest establishments during the year has amounted to Rs. 4,60,100-7-6 under the following Budget sub-heads:—

	Rs.	a.	p.
B. I. a.—Conservator's salary ...	18,000	0	0
B. II. a.—Conservator's travelling allowance ...	2,400	0	0
B. I. b.—Superior officers' salary ...	1,01,985	11	10
B. II. b.—Superior officers' travelling allowance ...	25,688	12	5
B. I. c.—Subordinate protective establishments' salary ...	2,53,131	0	6
B. II. c.—Subordinate protective establishments' travelling allowance ...	14,524	5	3
B. I. d.—Office establishments' salary ...	33,084	15	0
B. II. d.—Office establishments' travelling allowance ...	11,285	10	6
Total ...	4,60,100	7	6

2.—GENERAL PROTECTION AND BREACHES OF THE FOREST LAW.

89. The following statement gives the number and result of prosecutions of Forest offences during the year as compared with that of the past year:—

No.	Division.	1887-88.		1888-89.		Percentage of Failures.	
		Prosecutions.	Acquittals.	Prosecutions.	Acquittals.	1887-88.	1888-89.
1	North Thána ...	61	22	72	34	36.0	47.2
2	South Thána ...	185	34	209	51	18.3	24.4
3	East Khándesh ...	15	5	48	15	33.3	31.2
4	West Khándesh ...	71	20	126	27	28.1	21.4
5	Násik ...	79	19	48	5	24.0	10.4
6	Ahmednagar ...	53	14	53	15	26.4	28.3
7	Poona ...	66	20	279	47	30.3	16.8
8	Sátára ...	44	10	44	17	22.7	38.6
9	Sholápur ...	77	23	101	34	29.8	33.6
10	Surat ...	33	3	9	...	9.0	...
11	Panch Maháls ...	25	1	42	10	4.0	23.8
	Total ...	709	171	1,031	255	24.1	24.7

90. Out of 1,139 cases, made up of 112 cases that were pending at the close of last year and 1,027 new cases presented during the year, 1,031 were disposed of, as shown above; leaving 108 cases pending at the close of the year in the different divisions as under :—

No.	Division.						Number of Cases.
1	South Thána	...	...	...	...	...	14
2	East Khándesh	...	...	...	...	...	2
3	West Khándesh	...	...	...	...	...	20
4	Násik...	...	...	...	...	...	14
5	Ahmednagar	...	...	...	...	...	6
6	Poona	...	...	...	...	...	33
7	Sátára	...	...	...	...	...	1
8	Sholápur	...	...	...	...	...	18
Total ..							108

91. In consequence of the exemption of timber and other produce growing in private lands from the operation of the rules under Section 41 of the Forest Act, and to the ease with which timber illicitly cut in Government forests can be passed off as coming from máłki lands which adjoin and interlace the former, the detection of offenders continues to be of considerable difficulty, especially with a staff of forest guards numerically insufficient to maintain close watch over, so as to effectively protect, the extensive areas of forest-land which have been constituted Reserved and Protected Forests.

92. From the statement given above it will be seen that there is an increase of 322 in the number of prosecutions as compared with the figures of last year; this increase is due to increased vigilance on the part of the protective staff. The percentage of failures in prosecutions is about the same as obtained last year.

93. The classification, as prescribed by the Forest Department Code, of Forest offences in respect of which prosecutions have been instituted during the year is given in the following table :—

No.	Division.	CHARACTER OF OFFENCES.				REMARKS.
		Injury to Forest by fire.	Unauthorized felling or appropriation of Wood and minor Forest Produce.	Grazing without permission or in tracts in which Grazing is prohibited.	Other Offences.	
1	North Thána	...	57		8	
2	South Thána	1	173	3	27	
3	East Khándesh	...	31	3	8	
4	West Khándesh	11	16	2	78	
5	Násik	...	35	10	7	
6	Ahmednagar	...	12	18	20	
7	Poona	...	82	197	33	
8	Sátára	2	20	10	5	
9	Sholápur	1	5	81	22	
10	Surat	...	5		2	
11	Panch Maháls	...	38		4	
Total		15	474	324	214	

94. The Forest offences which were detected in the Protected Forests of the unsettled talukas of the Thána Collectorate were disposed of by Assistant Collectors in accordance with Government Resolution No. 7844, dated 3rd

October 1884, under Section 43 of the Land Revenue Code, and do not appear in the foregoing statement :—

Forest Division.	1887-88.					1888-89.					REMARKS.
	Number of Cases.	Value of Forest Produce.	Acquittals.	Convictions.	Amount of Fines.	Number of Cases.	Value of Forest Produce.	Acquittals.	Convictions.	Amount of Fines.	
		Rs. a. p.			Rs. a. p.		Rs. a. p.			Rs. a. p.	
North Thána...	13	66 10 0	...	11	31 10 0	42	275 15 0	...	42	275 15 0	
South Thána...	92	355 9 0	...	92	104 4 2	61	89 6 9	...	61	118 12 3	
Total ...	105	422 3 0	...	103	135 14 2	103	365 5 9	...	103	394 11 3	

95. Some serious cases of dālhi cultivation made unauthorizedly within Reserved Forests in the Karjat and Khálápúr Ranges of the South Thána Division occurred during the year. The Thákurs on the slopes of Mátherán were detected encroaching deliberately on the Government forests, cultivating by means of the axe and fire beyond the limits of the lands which had been allotted to them and had been demarcated by stone cairns; and by orders of the Collector heavy assessment was taken from the offenders in respect of the forest areas cleared and cultivated by them.

96. The following is a comparative statement of the number of cases compounded under Section 67 of the Forest Act in the several divisions of the Northern Circle:—

Number.	Division.	Taken into Court.		Compromised under Section 67 of the Forest Act.		Total Number of Cases.	
		1887-88.	1888-89.	1887-88.	1888-89.	1887-88.	1888-89.
1	North Thána ...	68	65	26	38	94	103
2	South Thána ...	191	204	182	306	373	510
3	East Khándesh ...	20	42	153	280	173	322
4	West Khándesh ...	72	107	254	454	326	561
5	Násik ...	83	52	714	1,137	797	1,189
6	Ahmednagar ...	48	50	2,115	2,199	2,163	2,249
7	Poona ...	63	312	449	439	512	751
8	Sátára ...	50	37	186	250	236	287
9	Sholápúr ...	81	109	977	952	1,058	1,061
10	Surat ...	35	7	21	17	56	24
11	Panch Maháls ...	25	42	65	82	90	124
	Total ...	736	1,027	5,142	6,154	5,878	7,181

97. The amounts realised on account of cases compounded under Section 67 of the Forest Act in the several divisions of the Northern Circle during the year are as under :—

Number.	Division.	Amount.
		Rs. a. p.
1	North Thána ...	352 2 9
2	South Thána ...	1,202 9 10
3	East Khándesh ...	973 0 6
4	West Khándesh ...	1,557 7 7
5	Násik ...	1,736 0 6
6	Ahmednagar ...	2,463 2 9
7	Poona ...	1,459 7 9
8	Sátára ...	305 7 1
9	Sholápúr ...	1,054 5 10
10	Surat ...	71 0 0
11	Panch Maháls ...	97 2 4
	Total ...	11,271 14 11

98. The number of cases compounded during the year has increased in almost all divisions. The scarcity of fodder for cattle which was felt during the year in some of the Deccan districts induced much trespassing of famishing cattle into plantations and closed forests.

99. The number of cattle of different kinds impounded during the year under Section 69 of the Indian Forest Act for trespassing in plantations or in closed portions of forest reservations in the several divisions of the Northern Circle is given in the following statement :—

No.	Division..	Cows and Bullocks.	Buffa- loes.	Camels.	Horses.	Asses.	Sheep.	Goats.	Total.
1	North Thána ...	259	36	...	...	...	...	...	295
2	South Thána ...	184	...	...	...	...	...	...	184
3	East Khándesh ...	3,814	3,512	...	10	...	106	2,420	9,862
4	West Khándesh...	9,135	1,072	1	220	4	4,690	5,122	20,244
5	Násik ...	4,575	425	...	78	28	3,363	4,961	13,430
6	Ahmednagar ...	34,079	4,050	...	654	76	37,039	10,241	86,139
7	Poona ...	8,857	1,758	...	72	54	10,815	6,629	28,185
8	Sátára ...	5,513	582	...	62	12	5,612	2,352	14,138
9	Sholápur ...	15,824	3,637	...	193	5	7,186	533	27,378
10	Surat ...	121	72	...	...	...	...	17	210
11	Panch Maháls ...	83	136	11	1	78	...	246	555
	Total ...	82,444	15,280	12	1,290	257	68,811	32,521	200,615

100. It will be seen that larger numbers were impounded in the Deccan divisions than elsewhere. Owners of sheep and other cattle purposely drive their animals into closed forest to graze at the risk of detection, and impounding once or twice in the course of a year, and they willingly pay the pound fees which are manifestly less than the value of the grazing the animals enjoy, and the fact points to the conclusion that the rates of grazing fees charged by the Forest Department are much lower than might be reasonably demanded, and it is well known they are much less than villagers who possess pasturage lands demand of their neighbours.

3.—CIVIL SUITS.

North Thána Division.

101. A suit was brought by one Balvantrao Hari Gavankar against the Forest Department in the District Court of Thána to recover Rs. 200 which he paid as earnest money to the Divisional Forest Officer, North Thána, at the time of making a tender for the timber in the Karjon compartment of the Bassein Range, which he subsequently repudiated. This suit was not heard up to the close of the year. Government in their Resolution No. 4309, dated 14th June 1889, Revenue Department, have undertaken to defend this suit.

South Thána Division.

102. There were three civil suits brought against the Forest Department in this division in the District Court of Thána during the year :—

First, by Alli valad Mohidin Pátíl of Bhiwandi for Rs. 100, claiming Rs. 50 as compensation for losses sustained by breach of contract and the return of Rs. 50 deposited by him. In 1885 certain felled firewood had been sold to this contractor at the rate of Rs. 1-5-3 per cart-load; after removing about 40 cart-loads of the wood in the ordinary cart of the district he introduced carts from Bhiwandi capable of carrying twice the quantity of wood of the local cart, and on being prevented from using these carts he struck work and filed the suit, which Government in their Resolution No. 4777, dated 18th July 1888, Revenue Department, sanctioned to be defended, but it had not been decided up to the close of the year.

Second.—By Vithu Mahad Pátíl of Murbe for Rs. 459-5-7. The circumstances of the case are, that of certain timber which had been sold to this man he refused to take delivery of a quantity valued at Rs. 350-5-7 on the plea that it was damaged. This Department then, upon the grounds that the timber had been damaged through Vithu's fault, recovered the above sum from him under the Forest Act, and he then instituted a suit claiming the return of the amount *plus* Rs. 100 for loss of profit and expenses. Under orders contained in Government Resolution No. 5110, dated 30th July 1888, in the Revenue Department, the case was compromised, according to the advice of the Legal Remembrancer by repayment to Vithu Mahad Pátíl of the sum of Rs. 350-5-7 *plus* Rs. 59-4-1, on account of expenses.

Third.—By one Parbhudas Govindaji Thaker of Dáhanu for Rs. 823-8-0 for loss alleged to have been sustained by him owing to the issue of passés to cover the removal of bámbus which he had cut in a departmental contract having been refused to him by the Range Forest Officer, who entertained suspicions regarding the material. The defence of this suit was sanctioned in Government Resolution No. 309, dated 16th January 1888, and the District Judge of Thána passed a decree partly in favor of the plaintiff and partly in favor of Government, awarding to the plaintiff Rs. 321 for damages and Rs. 112-4-9 on account of expenses.

Poona Division.

103. It was reported in paragraph 110 of last year's report that the High Court reversed the judgment of the Small Cause Court in the case of Dipchand Balkisan Lodhi *vs.* Mr. Waman Ramchandra Gaúnde, Sub-Assistant Conservator of Forests. The Subordinate Judge in the meanwhile refused to delay the execution of the decree, and the amount of Rs. 435-2-11 was paid by Mr. Gaunde to Dipchand. When the judgment was reversed an unsuccessful endeavour was made to recover this money from Dipchand Lodhi, but no assets belonging to Dipchand could be found. Following the judgment of the High Court, Dipchand instituted a fresh suit in the District Court of Poona, and Government in their Resolution No. 7028 of the 23rd October 1888, sanctioned its defence upon the lines recommended by the Legal Remembrancer, but up to the close of the year the case had not been completed.

4.—FOREST FIRES.

104. Fire conservancy has received very considerable attention during the year under the working of the circular order referred to in paragraph 111 of last year's report, and although the total area traversed by fires is recorded as greater this year than of last year, still the result is not unsatisfactory when all the circumstances are taken into account, for fire conservancy is affected by various conditions, in some years they are favourable and in other years they are inimical. The year of the report was what may be termed "a dry year" in the Deccan and Khándesh, for the monsoon rains were delayed and the fall was abnormally small, and there was an absence of late heavy rains in parts of the country, so that the forests became inflammable earlier in the season than ordinarily, and were more ready to burn later on than happens when the springs and pools do not dry up so quickly, and there is more moisture on all sides. This state of things renders a comparison between the results of the year of this report and of the preceding year no fair test of the exertions of the forest subordinates and of the co-operation of forest villagers in protection against fires. A complete report regarding every fire was drawn up and submitted to the Conservator by the Divisional Forest Officer, and thus the proceedings of all parties, who were responsible for fire conservancy where fires appeared, came under close inquiry.

105. For fire conservancy to be effective all round, a numerically sufficient permanent staff of forest guards is required to be employed. Temporary watchers, who have very little to gain and nothing to lose, are not worth their cost on this side of India where labour is comparatively dear. It is possible, as has been stated, that the forest protective establishment of the Northern Circle is as numerous as anywhere in Europe, but the conditions of Western India and of

Continental Europe are so very widely divergent that no reasonable comparison can be drawn from mere numbers. The indigenous forest guard is not nearly so capable a man as is his confrère in France, or Germany, or elsewhere in Europe, and the local conditions which affect forest conservancy bear no similarity. The State forests of Continental Europe are not open to the world to come and go. The pot-hunting shikári is not permitted to roam over the forests with a rusty matchlock, or an old percussion musket, to go wheresoever he may list, to take axes and cutting implements with him, to carry fire and the means of kindling fire in his pouch, to build ambuscades over water and pathways from which the timid hind and its fawn can be mercilessly slaughtered. The pot-hunting shikári finds the forest undergrowth against him, for it affords cover to deer and other animals, and it prevents him seeing the animals as they approach his place of ambush, so he strikes a light, sets fire to the grass, &c., and strolls away in another direction until fire has effected the clearance desirable to his murderous game, and he is a long way from the spot by the time the forest guards and forest villagers attracted by the rising smoke have come to extinguish the fire and discover its cause. If seen by them there is no direct evidence to convict the man, who has the privilege to come and go, with the fire; he has a story cut and dried to account for his presence, and he probably joins the band who are zealously attacking the fire, and is commended, and may be rewarded, for the assistance he has given. The dead-wood privilege is a fruitful source of fires, for when the natural supply fails the axe and fire readily manufacture the article, which may be taken for domestic use and for barter and for sale. Where such conditions adverse to fire conservancy prevail, especially strong establishments to guard and to patrol are necessary, and the strongest staff cannot always secure the salvation of a forest against fire.

106. It is very satisfactory to note that forest villagers do take an interest in fire protection, inasmuch as they turn out readily to help in putting out fires which have occurred; but it must at the same time be recorded against them that they do not give any information regarding the cause of a fire, and their assistance in detecting the shikári, or the privilege-holder, or the negligent ráb-burner, or the careless way farer, who may have set the forest on fire, cannot be counted upon, for such proceeding may lead to reprisals, as the man who is the informant one day may be the offender the next.

107. In the North and South Thána Divisions decided improvement can be recorded, the total area burnt being 15,049 against 19,848 in the preceding year in the former, and 13,914 against 17,121 acres in the latter division. The usual precautions of burning fire traces along spurs and ridges and the most frequented foot-paths and cart-tracks to prevent fires invading and spreading, were adopted. Warnings were also issued to forest villagers in the sense of Government Resolutions Nos. 4120, 1942 and 1751, dated 21st May 1885, 24th March 1888 and 4th March 1889, that privileges upon the forests might be suspended if fires should prevail; but the condition directed in Government Resolution No. 1942, dated 24th March 1888, that one-third of the forest area must have been burned before the exercise of privileges can be stopped, deprives the ordinance of its utility, as very seldom, if ever, do the forest guards and villagers display such dilatoriness, or negligence, as to permit one-third of the forest area of a village to be burned by a fire, however deliberately it may have been planned and ignited. Into the forests of the Thána District the native shikáris crowd, for there are licensed and unlicensed guns in almost every village. From the Jowhár State the pot-hunter invades the Thána forests, and these shikáris go about in large bands—a gang of over 100 men were met by the Conservator in the Harshándragad forests. And so long as they are not detected in doing anything that is forbidden they cannot be interfered with in the absence of game laws.

108. In the East Khándesh Division, although the area burned is somewhat less than that of the preceding year, still no appreciable improvement can be looked for so long as the privilege-holder may range the Sántpuda forests from end to end: here the undergrowth is fired out of fear of wild animals, and not for the purpose of manufacturing dead-wood, or to conceal thefts of timber, as is done in the Thána District, where kerosine oil is poured upon the bleeding

stumps of freshly felled trees so that the fire may remove the traces of recent felling.

109. Notwithstanding all the efforts the Forest Department in West Khándesh Division, under Mr. Fagan's energetic direction, have made to prevent and check fires, the portion burnt during the year was much larger than of the past year, being 643,169 acres against 476,454 acres in 1887-88, a dry season having been more conducive to fires. The people have legal access to all and every part of the forests of this division also, and so long as the Forest subordinate staff is not strong enough to watch in every direction, such high results as are obtained in divisions easier to protect cannot be expected. The Bhil is a born shikári, and forests are fired to clear undergrowth which gives cover to game and conceals rat-holes, and they are likewise fired so that a nice thick layer of ashes will facilitate the tracking of animals to their lairs, foot prints in the ashes being as clear and visible as in freshly fallen snow. The collection of mhowra and of honey is also conducive to fires occurring in the Sátputa forests.

110. In all the Deccan divisions of the Northern Circle, except Násik and Sholápur, the spread of fires during the year was not so great as during the preceding year. More cattle were admitted into the Násik and Sholápur forests to graze, owing to the failure of pasturage elsewhere, and the forests were more inflammable; and thus the causes of fire were more prevalent. In the Surat Division the leased Dáñgs, which owing to their local circumstances are not subjected to strict forest conservancy, have caused the area burnt to be so very large. Here the Bhils and wild classes can do whatever they like, even to making Dáhli inside the forests, and thus fire conservancy is practically non-existent. The portion of the Dáñgs forest fired during 1887-88 was not reported correctly in last year's returns.

111. The following is a comparative statement of forest fires :—

No.	Division.							Area burnt, 1887-88.	Area burnt, 1888-89.
								Acres.	Acres.
1	North Thána	...	...	...	...	...	...	19,848	15,049
2	South Thána	...	...	...	...	...	...	17,121	13,914
3	East Khándesh	...	...	...	...	...	...	16,247	15,867
4	West Khándesh	...	...	...	...	...	...	476,454	643,169
5	Násik	...	...	...	...	...	...	2,333	12,074
6	Ahmednagar	...	...	...	...	...	...	2,935	2,555
7	Poona	...	...	...	...	...	...	2,429	1,635
8	Sátára	...	...	...	...	...	...	993	481
9	Sholápur	...	...	...	...	...	...	1,393	1,852
10	Surat	...	...	...	...	...	...	27,029	298,531
11	Panch Maháls	...	...	...	...	...	...	39,494	11,088
Total								606,276	1,016,215

112. It may be that the forest area attempted to be protected against fire is greater than the reserved and protected forests of the Circle put together as appearing in the forest area statements; but this can be explained by the fact that the forest and waste lands which are provisionally notified from time to time, and are not finally settled and constituted reserved forests before the end of the year of the report, do not appear in Form No. 49 and in the total of reserved or protected forests, but every acre of forest land directly it is handed over to the charge of this Department is put into a "beat", and is brought under protection against thieves and fire by the agency of a forest guard; and hence the apparent discrepancy between the figures, which the Government of India have remarked upon in paragraph 11 of their letter No. 816-F, dated 5th August 1889, upon the Forest Administration Reports of the Bombay Presidency for 1887-88.

113. The expenditure upon fire conservancy has amounted to Rs. 1,697-6-0, which may be considered to be a small outlay; it does not include pay of special

watchers, for no such staff is employed in the Northern Circle, but it represents payments made to forest villagers either as wages, or as rewards, for working in the extinguishment of forest fires.

114. Fire statistics, more especially when they enter into minute details, must be regarded with considerable caution, because the portion of a forest which may be burned is never surveyed and measured to ascertain the exact area covered by the fire, and the area that escaped. The figures which appear in the returns are mere estimates, and the tendency on the part of a forest officer, who is directly responsible for fire protection, is to decrease and not to magnify the proportion of failures. Possibly in this Presidency the estimates are as correct as, if not more nearly accurate, than in other parts of India, because the Revenue Survey Department has demarcated and mapped the entire country into survey numbers, the acreage of which has been ascertained by cross staff and theodolite survey measurement, as the case may be, and is recorded, and the boundaries of these survey numbers exist upon the ground, and their presence affords a guide for determining the acreage of a fire. The following statement will give the results of fire-protection during the year :—

No.	Division.	Forest Acreage.	Acreage burned.	Percentage burned.	Total Expenditure incurred.	Remarks.
		Acres.	Acres.		Rs.	
1	North Thána ...	381,296	15,049	3·9	1,106	
2	South Thána ...	434,965	13,914	3·1	473	
3	East Khándesh ...	545,921	15,867	2·9	22	
4	West Khándesh ...	917,567	643,169	70·0	45	
5	Násik ...	817,828	12,074	1·4	36	
6	Ahmednagar ...	556,885	2,555	4·5	...	
7	Poona ...	473,748	1,635	0·34	...	
8	Sátara ...	426,269	481	0·11	15	
9	Sholápur ...	174,526	1,852	1·0	...	
10	Surat ...	478,524	298,531	62·3	...	
11	Panch Maháls...	206,381	11,088	5·3	...	
	Total ...	5,413,910	1,016,215	18·7	1,697	

5.—GRAZING AND FODDER-GRASS.

115. The revenue from grazing and fodder-grass has increased considerably during the year, being Rs. 78,310 over and above the receipts of the previous year, and the steady expansion of this source of revenue which has been going on during the past ten years, as will be seen from the following figures, has been more than maintained :—

	Rs.
1878-79	... 42,629
1879-80	... 64,613
1880-81	... 1,00,443
1881-82	... 1,41,765
1882-83	... 1,64,444
1883-84	... 1,97,963
1884-85	... 2,25,853
1885-86	... 2,32,650
1886-87	... 2,37,126
1887-88	... 2,48,855
1888-89	... 3,27,165

116. The abnormal increase of the year is probably due chiefly to closed forest areas having been opened to the grazing of cattle at the request of Revenue officers, and with the approval and sanction of Government, on payment of fees in the Deccan districts of the Northern Circle owing to scarcity of fodder, which the delayed monsoon rainfall had caused. On the other hand the gradual improvement in quality and quantity of grass, which is mainly due to forest con-

servancy, has much to do with the expansion of revenue under this head, as the progressive augmentation of prices realized in auction sales of the grass in certain areas, which is sold for cutting and removal, evidences.

117. The following statement exhibits the working plan of the forests of the different divisions in respect of grass and grazing for the year :—

No.	Division.	VALUABLE KUMANS.		FEE GRAZING.			AUCTION GRAZING.		FREE GRAZING.			GRASS GIVEN TO COMMISARIAT DEPARTMENT.		Area closed to Grazing.	Miscellaneous Grazing Revenue.	Total Grazing Revenue.
		(a) Area.	(b) Amount realized.	(a) Area.	(b) Number of Animals grazed.	(c) Amount realized.	(a) Area.	(b) Amount realized.	(a) Area.	(b) Number of Animals grazed.	(c) Money value of the privilege or right.	(a) Area.	(b) Amount			
		Acres.	Rs.	Acres.		Rs.	Acres.	Rs.	Acres.		Rs.	Acres.	Rs.	Acres.	Rs.	Rs.
1	North Thána	10,612	13,316	...	...	...	...	...	353,014	171,750	42,937	...	...	9,758	...	13,316
2	South Thána	4,005	871	416,044	20,117	6,380	...	...	...	178,888	25,000	...	...	11,916	48	7,280
3	East Khándesh	31,195	14,541	378,391	199,069	25,318	...	...	...	11,829	1,375	...	...	136,835	6,513	46,372
4	West Khándesh	20,653	4,640	831,625	696,577	43,769	177	...	...	81,007	9,049	...	...	66,112	6,961	54,870
5	Násik	36,282	16,608	508,069	247,689	24,916	...	...	180,286	248,382	36,800	...	...	83,191	1,769	43,293
6	Ahmednagar	4,601	2,091	361,950	213,175	88,187	...	...	14,361	56,771	1,704	1,067	4,387	165,341	2,952	40,864
7	Poona	54,449	38,595	118,489	67,000	10,734	84,797	2,098	145,095	...	50,000	11,322	35,000	51,631	928	52,355
8	Sátára	57,682	28,106	83,124	81,929	4,392	91,379	7,968	135,363	...	17,500	...	...	30,792	35	40,500
9	Sholápur	34,643	8,919	42,385	71,469	11,049	20,181	686	12,293	70,742	9,196	...	...	65,074	1,216	21,769
10	Surat	...	...	40,885	5,981	650	3,399	144	381	...	69	...	...	...	...	794
11	Panch Mahals	17,572	2,282	19,410	9,718	3,447	...	...	135,000	58,000	15,000	...	...	1,025	4	5,733
	Total	271,694	1,30,868	2,800,372	1,562,784	1,63,342	207,961	12,530	975,993	877,367	2,06,630	12,389	39,387	634,175	20,425	327,163

118. Much damage, difficult of detection, is caused to forest growth by herdsmen in charge of cattle, who lop off the branches and the young shoots of trees, so that the cattle may feed on the leaves. This is more especially the case in years like this under report, when the rainfall has been scanty and fodder scarce in consequence. The preservation of grass on hill slopes, which have been denuded of all superior vegetation, is essential to guard against the occurrence of floods. It is not only the replanting of hill sides with trees that serves this purpose, but grass contributes to it in many ways: it absorbs much water itself, and it retards the progress of water down a slope, when the growth is thick and luxuriant, and thus gives the earth time to take in much of the fallen water that would otherwise pass over it, and grass is a potential agent in forming soil, for its roots break up the hard ground and open the pores of the earth. For these and other similar reasons the exclusion of sheep and goats from grazing areas on hill slopes placed under treatment for reboisement is the first step towards improvement, for these animals being close feeders tear up the grass root stocks, and thereby cause not only the utter destruction of the pasturage of cattle, but accentuate denudation also.

6.—FENCING.

119. In the North Thána Division wire fences, $5\frac{1}{4}$ miles in length, were erected during the year in the Sálsette Range at a cost of Rs. 230-9-10; and wire fences round the Wankas Kamare and Khaire plantations in the Máhim Range were repaired at a total cost of Rs. 48-1-3. The euphorbia fence round the casuarina plantation in the Dáhánu Range was put into order at a cost of Rs. 5-8-0.

120. 78,831 running feet of prickly pear fencing were planted at a cost of Rs. 421-10-9 in the Ahmednagar Division, and 15,457 feet by the forest guards without extra cost.

121. In the Sátára Division 44,407 running feet of aloe hedging were planted at a cost of Rs. 218-2-2, and chilari seed was also sown in furrowed lines round some of the plantations, and the old aloe fences were also repaired.

122. The following statement will show the fencing operations which were carried on in five out of seven ranges of the Sholápur Division during the year, the material used being "sher," *Opuntia tirucalli*, and prickly pear, *Opuntia dillenii* :—

No.	• Range.	Running feet.	Amount.
			Ra. a. p.
1	Sholápur	12,135	125 5 0
2	Bársi	2,574	25 4 0
3	Mádha	3,250	35 10 0
4	Karmála	3,640	35 8 0
5	Pandharpur	4,875	20 0 0
	Total ...	26,474	241 11 0

7.—NATURAL REPRODUCTION.

123. Concurrently with the establishment of fire conservancy natural reproduction has made more decided and satisfactory progress. In the two Thána divisions during the rainy season, the germination of self-sown seeds is profuse, and seedlings carpet the ground throughout the forests, teak, ain and khair being especially abundant. In this connection it will not be out of place to give an extract from the North Thána Divisional Forest Officer's diary for the month of December 1888; against the 20th it is recorded:—

“On the way inspected the closed portion of the forests in the village of Rabale and Ilton, neither of these has been enclosed with wire-fencing, &c. In Rabale the portion of the forest selected for closure is very suitable for planting operations, already there is a fairly dense growth of brushwood and along the upper slopes a very large number of self-sown mhowra seedlings are to be seen. The old teak stools too which till a few years back, when a proper system of conservancy was introduced, had been suppressed by fires and the axes and koitas of the neighbouring villagers, are now throwing up vigorous shoots and fast developing into seed-bearing trees and are thus assisting in the work of reboisement. In fact throughout this range of hills the reappearance of teak among other vegetation is most marked. I have inspected these forests regularly now for the last four or five years, and each year I notice an improvement. The closed portion of the Ilton forests through which I also walked is situated on the upper slope of the hills, and contains a very promising growth of teak coppice, which in a few years will be bearing seed and assisting in the work of reboisement. The pátíl of the village, an oldish man, who met me on the Rabale boundary, tells me that his grandfather, who died a few years ago, had told him that these forests were at one time very well stocked with teak and other timber, but that owing to reckless cutting for the supply of Bombay market they were quite destroyed and reduced to their present barren condition. The reappearance of the teak, khair and other woods quite bears out the story, and all we now require to re-stock these forests again is good fire protection, plentiful broad-casting of mixed seeds and strict exclusion of cattle from the closed portions.”

124. In the Deccan divisions of the Northern Circle, natural reproduction from coppice shoots and seeds was good generally, but the scanty rain-fall was not so favorable to germination and growth as in a year of a “seasonable rain-fall.” The Divisional Forest Officer, Poona, reports that he has seen many reserves where the natural reproduction was most satisfactory, and he has also seen large areas where reproduction was certainly at a standstill, even if denudation was not going on steadily. This is owing to the free grazing of cattle on fixed areas without any restriction as to season, and without limitation of numbers of cattle according to the grazing capabilities of the different forest areas.

125. The cutting of thorns by villagers on payment of fees not only retards reboisement but also promotes denudation. The practice is an unmitigated evil, and an unnecessary evil. Thorns bind the little soil remaining upon the hill-sides, they create new soil, they provide cover and shade, they break the dropping force of rain, they check the surface off flow of water, they absorb a quantity and convey it under ground, and they nurse and protect seedlings. To fence an ordinary sized field with thorns causes the stripping of wide stretches of hill side with the exposure of its surface, while the thorns dry, rot, are blown away or taken for fuel purposes before the crop they were intended to protect has been harvested; cultivators do not fence all their fields, and they certainly could get no thorns from the hill sides when the latter were quite bare of vegetation, so custom cannot be urged as an excuse to continue a practice, which is harmful in the

extreme to reboisement, and indeed to agriculture, for it retards the rehabilitation of the natural reservoirs of the country. The cutting of thorns should be strictly forbidden upon the semi-denuded forest hill sides of the Deccan, and no permission to cut thorns or other vegetation within the reserved forests should be given by any authority save of the responsible Forest officers, for if Forestry is a technical and scientific profession, its principles must be observed, and the removal of vegetation, however inferior it may be considered to be, to the prejudice of forest conservancy, to the sacrifice of reboisement, and to the promotion of denudation, should be avoided. In the Gujarāt Forest divisions of Surat and Panch Mahāls, reproduction has been as satisfactory as forest fires and cattle will allow; fire and grazing prevent the results being as apparent as they should be. Seedlings which escape fire and drought during the first few months after the monsoon often survive only to be finally disposed of by half-starved cattle at the commencement of hot weather.

126. In the Eastern Deccan ranges which were the centres of famine during 1877-78, and where the rainfall is generally uncertain and often deficient, the increase of game, deer especially, is safe evidence of the growth of cover, showing that the reboisement of denuded lands, which have been constituted reserved forests since the famine year, is fast becoming an accomplished fact. These reserves are visited constantly by professional poachers with their nets and snares and other devices for trapping and destroying game, otherwise the increase of game would have been much greater. The desirability of a few simple game laws, under which a close season could be enforced at the times when animals and game-birds produce their young, and under which sanctuaries also could be established, where traps and snares would be unknown, and the pot-hunter's presence would not be seen, is great, not only in the interests of the preservation of game, a source of food-supply, and of industries, but in the interests of reboisement also, for the damage that a band of Wāghris with their nets to catch hares do to the young growth in a forest has to be seen before it can be believed.

8.—ARTIFICIAL REPRODUCTION.

127. In the North Thána Division, of 127 khandis 9 maunds 2 sers of mixed seeds of all kinds some were broad-casted, and some were sown in prepared ground, and 30,818 seedlings obtained from neighbouring forests were transplanted over the several compartments, which had been coupes of the past season, and in other blank parts of the forests. Rhizomes of bámbu were brought from distant bámbu forest and planted in forests from whence the bámbu had been exterminated. In the South Thána Division 96 khandis of seeds of different kinds collected by beat-guards were sown broad-cast, over coupes and compartments, and plantations were made in some of the recently occupied lands which had been acquired for forest conservancy upon the catchment of the Tánsa Lake, the seeds being sown in pits prepared for their reception. Germination was successful, but in spite of the precautions taken the whole area was subsequently traversed by fire and the young seedlings were burnt to the ground. The cart road from the Tánsa works to the Atgaon Railway Station forms the boundary of the plantation, and the traffic is heavy and constant, and some cartman or wayfarer threw fire carelessly into the grass, and the whole area was soon in a blaze.

128. In the two Khándesh Divisions the usual systems of plantations, viz., of ploughing, dibbling and broad-casting, were resorted to, but the results were not satisfactory, owing to scanty rainfall. In the Násik Division the plantations in Niphád, Yeola, Málegaon, Dindori, Násik and Igatpuri ranges were thriving notwithstanding the drought. In the Ahmednagar Division 20,903 acres were treated, some of the seeds being deposited in pits and some broad-casted with 152 khandis of mixed seeds. In the Poona Division 182 khandis of different kinds of seeds were sown.

129. In the divisions of Sátára, Sholápur, Surat and Panch Mahāls, although plantation operations were undertaken as usual, still owing to scanty rainfall marked progress under this head cannot be recorded.

130. The following statement gives the details of the works of artificial reproduction undertaken during the year, with total cost incurred thereon, in all the divisions of the Northern Circle:—

No.	Division.	REGULAR PLANTATIONS.				CULTURAL OPERATION.				Total Cost.
		Area in Acres.				Area in Acres.				
		On 1st April 1888.	Added	Ex-cluded.	On 31st March 1889.	On 1st April 1888.	Added.	Excluded.	On 31st March 1889.	
										Rs. a. p.
1	North Thána	2,209	...	...	2,209	430	5,487	...	5,917	1,172 15 3
2	South Thána	315	152	...	467	2,553	1,461	...	4,014	679 13 7
3	East Khándesh	...	10	...	10	11,695	437	...	12,132	263 14 2
4	West Khándesh	...	38	...	38	18,837	623	...	19,460	279 1 1
5	Násik	...	...	...	...	4,060	987	100	4,947	2,740 12 2
6	Ahmednagar	142	...	...	142	6,513	911	...	7,424	884 1 1
7	Poona	...	...	...	...	32,681	1,986	...	34,667	1,332 12 2
8	Sátára	1,957	614	...	2,571	65,742	20,009	...	85,751	859 10 11
9	Sholápur	...	...	...	...	11,804	10,641	...	22,445	1,806 1 11
10	Surát	...	...	...	...	2,615	17	1,715	917	11 0 0
						5 miles.		5 miles.		
11	Panch Maháls	...	26	...	26	148	140	...	288	127 2 7
	Total	4,623	*840	...	5,463	157,078 5 miles.	42,699	1,815 5 miles.	197,962	10,177 4 11

131. In his excellent review of the Forest Administration Report of the North Circle for 1887-88, the Commissioner, C. D., called attention to the thick luxuriant growth of bábul on the slopes of the embankments of the Southern Maráthá Railway, which are entirely unprotected, and compared it with some bare tracts of forest land adjoining, and suggested that plots should be dug up and fenced all over these tracts, and should be sown with bábul seeds. In reference to this recommendation, it must be explained that the embankments are made of earth heaped up, and consequently there is a rich deep soil, comparatively loose, into which the tap and other roots, of the recently germinated bábul seedlings, penetrate deeply at once, and the plants become established, and from their position are removed out of danger of harm or destruction from cattle. The case of the bare forest lands is very widely different; here, there is generally no soil, and where there may be a little, it is of no depth, and the surface is caked by sun and weather to the consistency of rock, for generations of cattle have constantly roamed, but not fattened, over these gáiráns. There is no earth to excavate, for moorum and rock where they do not crop up to the surface, are only an inch or two below, the root stocks of grass have been pulled out by the teeth of sheep and goats. The process of the formation of soil by the disintegration of rock under the action of the sun and rain and the working of the roots of grasses and the humblest vegetation was pointed out to the members of Forest Commission in the Bambhurdhe Reserve. Reboisement is necessarily a slow proceeding in such conditions, but it is sure and goes on steadily when the land is protected against cattle, the axe and fire. Nature is the great agent for the re-afforestation of the wide stretching denuded areas in the Deccan, and although she can be assisted by forest subordinates, she cannot be relieved entirely of her work, except at so great an expenditure as to render the usurpation utterly unprofitable, and then only can artificial production of superior vegetation be fitful and extend over very limited areas. The scouring force of the rainfall is very powerful so that if soil is dug up and has no vegetation to protect it, and is not heaped up and consolidated into embankments, the slopes being guarded by a facing of stones, the soil will be washed away. Some idea of the denudation existing and to be overcome and the consequent volume of the surface off-flowing rainfall may be realised by the facts stated by the Divisional Forest Officer, Poona. The water consumption of the city of Poona with the Cantonments of Poona and Kirkee and the demands of the irrigation of the Bhimthadi reduce the depth of the Fife Lake 1 foot in about 10 days, but 55 to 60 hours of rain at the commencement of the rains suffices to replenish the lake filling up the 25 feet expended during year. The Commissioner, Northern Division, in his critical

remarks upon the forest administration of last year observes that too much economy appears to be practised in artificial reproduction. "In Madras, last year, the sum of Rs. 65,000, being 5 per cent. of the total forest revenue, was expended on plantations," and judging from what he had seen, Mr. Sheppard was of opinion that the expenditure is likely to be largely remunerative. Mr. Sheppard had visited the Nilgheri hills and had seen the fine plantations of Australian and other exotic trees which have been so successfully established there. In this Presidency there is nothing of the kind, for the simple reason that situation, climate and soil do not offer. But at the same time it must not be forgotten that the forests of Mahábaleshvar yield a considerable revenue from hirdas, firewood, &c., &c. No doubt expenditure carefully incurred upon plantations in a country devoid of coal deposits and where timber and fuel are scarce, will be profitable, provided always that the climate and other local conditions are favourable. But in the Deccan, the region of a light and capricious rainfall, a great deal of money can easily be expended with very little advantage resulting. It would be a very bad policy to expend 5 per cent. of the forest revenue of the Northern Circle, in sowing seeds and planting out seedlings, which will never grow into trees, and in endeavouring to anticipate Nature. Where money can be wisely spent upon plantations, the Forest officers will ever be ready to urge such expenditure. Much work still remains to be undertaken in providing enclosures round the forest reservations to keep out cattle, and to secure the young trees against destruction, not in growing living hedges which are rarely or ever constant and continuous, for breaks occur where the soil is poor, where there are stretches of rock, where the hedge is damaged wilfully or by accident, and which also at their best take years to become protective, but in erecting wire-fencing, &c., which will give to cultural operations such immediate protection as is necessary to successful reproduction. In the bábul reserves of the champaign country of the Deccan every coupe is at present fenced in, as soon as the timber &c., has been exploited, with the branches and thorns of the felled trees, the soil is dug up and the whole surface is sown profusely with seeds which are then covered over, but it is found that the hedging dries and rots, and is blown away, cattle charge through it and make gaps, and the protection thus afforded is not sufficiently lasting. In the forcing climate of the Konkan and of Gujarát such elaborate measures are not necessary, the roots of the exploited timber in the ground must not be disturbed, for they throw up shoots before the rains commence as soon as the sap begins to ascend, and the seeds naturally shed in past years germinate under the new conditions of light and air; where there may be blank spaces devoid of superior vegetation, the forest guards dibble in seeds, and they broad-cast the coupes to supplement the natural distribution of seeds over the surface. So that every coupe of the season becomes virtually a plantation of the rains.

132. There is another point to be remembered in connection with artificial and natural reproduction upon forest lands in this Circle, *viz.*, that grazing and the grass supply are very important considerations, cattle have of necessity to be admitted into forest areas from which they should, if Forestry alone were to be considered, be rigidly excluded for a long term of years. And therefore re-afforestation has considerable disadvantages and obstructions to contend against and to overcome, and its course like the course of "true love" does not always run smoothly.

9.—EARLY THINNINGS, REMOVAL OF INFERIOR SPECIES, CUTTING OF CREEPERS, &c.

133. There is nothing of importance to record under these heads. The eradication of prickly pear from reserved forests was carried on by Forest guards and by hired labour in the Poona, Sátára and Sholápur Forest Divisions, where Rs. 293, 56 and 653 respectively were spent upon the operation. Forest guards were made to cut creepers, and to remove other inferior growth which required to be removed, in the forests of their several beats, and no special expenditure was incurred in such works of improvement.

10.—EXPERIMENTS WITH EXOTIC TREES.

134. The Divisional Forest Officer, Ahmednagar, reports that the exotics planted in nurseries in previous years are doing fairly well, and the Divisional

Forest Officer, Násik, states that the Mahogany plants, reported on last year as being $2\frac{1}{2}$ feet high, are still thriving and have attained a height of about 5 feet.

135. An experimental sowing of seeds of the date-palm was made throughout the Circle in all divisions. Some seeds were kindly supplied by the Director of Agriculture, but larger quantities were purchased in the Bombay bazaar to which Bussorah dates come from the Persian Gulf. The steamers and country craft conveying Arab and Persian horses to the Bombay market invariably have cargoes of dates on board. Dates are used in Persia and in Arabia also to feed horses and dogs; grey-hounds, which both Arabs and Persians delight to keep for coursing, are fed largely upon dates. And purchases of date seeds were also made in local bazaars in the mofussil. Nurseries were established in almost every range in each division, in places where there is command of water, and date seeds were sown in ground prepared according to prescribed directions. But the results have not been favourable generally. Germination is reported to have been poor; this is attributed to many of the seeds not being sound and having lost their vitality. Selected date seeds, which were sown in pots, and which received great attention and care, have done better, and the Divisional Forest Officer, Násik, reports that every seed thus sown in his own garden germinated, and the seedlings at the end of the year were one foot high, and there has not been one casualty among them. The Divisional Forest Officer of Sátára reports that there were 689 young date-trees surviving in the nurseries of his ranges at the close of the year. The Divisional Forest Officer, Panch Maháls, reports that germination was indifferent, that the plants were not strong and healthy, that many succumbed to the hot weather, and that about 24 were living at the end of March, and these were about 4 inches high. It is obviously too soon to look for any great result when the experiment is only six months old, no doubt many of the seeds which have not germinated will do so during the rains of 1889. The Conservator visited several of the nurseries of the date-palm in different ranges of the South and North Thána, the Násik and other divisions during his tour and he found young plants in all of them.

11.—COMMUNICATIONS AND BUILDINGS.

(a)—ROADS AND BRIDGES.

136. No new projects for roads were submitted by the Forest Department, and no constructions were undertaken by Forest officers, and no great expenditure was made directly from forest funds during the year, but existing roads and communications, which served for the transport of timber and other forest produce from the forests to markets, have been improved and extended in all divisions by the Public Works Department, and several new roads have been laid out, and considerable progress made upon them, at the cost of the Provincial Services Budget, towards which the Forest Department contributes a considerable sum annually. In the Thána divisions Rs. 7,718 were expended during the year by the Public Works Department upon the Dáhanu and Jowhár road; which up to date has cost Rs. 1,62,587. This road passes through the centre of a forest country, the southern portion of the Dáhanu Range, to Jowhár, the capital of the Native State of the same name, and it connects several rich and widely stretching forests of the Dáhanu Range to Sawte Bandar, and to the Dáhanu Station on the B. B. and C. I. Railway, thus providing these forests with water and railway carriage. The Shirghát-Paruli road, which was under construction last year in the South Thána Division, has made considerable progress during the year, Rs. 33,175 having been expended upon it, but it is not yet available for timber traffic though a section of it has facilitated the exploitation of timber, &c., from one of the coupes in the Mokháda Range. The road from Bhiwndi to Váda, which is used by timber traffic, has been metalled, and the ford of the Tánsa river has been paved, the expenditure of the year amounting to Rs. 8,931. Of the road from the Chahad Khind to Manor, essentially a timber road, 2 miles were opened to traffic in November 1888, and the earth-work up to Manor has been completed, and 14 drains and culverts constructed at an expenditure of Rs. 9,844 in the year.

137. In the Khándesh Collectorate the following works, which will open out forests and promote the circulation of timber, &c., in trade, occupied attention during the year :—

1. Enquiry was resumed as to improving communication across the Syhádri range with the Dángs so as to connect these valuable forests to the markets of Khándesh above the gháts.

2. Plans and estimates have been sanctioned for improving the Sakri-Ghorda portion of the Dhulia and Surat road and a survey of the Ghorda-Kondaibari road, the main traffic on which is timber and grass.

3. The Dhulia-Nandurbár road branching from the Bombay-Agra road at Songir, was advanced a stage.

4. The Dhulia-Sháháda road was also advanced a stage. Extension to Taloda and thence through the Raisingpur State to the Ankleshvar station of the B. B. and C. I. Railway has been partly surveyed. This road will serve the rich timber forests of the Taloda plains.

Several other roads, which greatly, if not chiefly, promote forest interests, were repaired, metalled or completed by the Executive Engineer, Khándesh, during the year.

138. Additions for Range Forest Officers' offices, were made to the Mám-latdár's Kacheri at Bhusával, and the Mahálkár's Kacheri at Bhadgaon. The new Kacheries completed or in progress at Sakri, Sháháda, Jámner, Navápur contain accommodation for the Range Forest Offices, and plans and estimates were preparing for providing offices at Taloda, Sindkheda and Shirpur and also in the proposed new Kacheries at Dhulia and Erandol.

139. The projected line of Railway starting from the Manmád junction upon the G. I. P. Railway line and travelling by way of Dhulia and Nandurbár to Surat, which has been reconsidered during the year, will, if constructed, develop the trade in timber and will give additional value to forest reservations in parts of Khándesh, and even in the Dángs, and will no doubt augment the forest revenues.

140. In the Násik Division :—

1. The Násik-Dindori and Kalvan road is now quite passable without hindrance from end to end, Rs. 9,629 having been expended upon it during the year and is used largely by timber carts.

2. A further portion of the Goldari and Ozar road in the Peint Range, which will serve teak and bāmbu forests in the Harsul sub-range was undertaken.

3. While in the north of the Peint forest country the construction of the Hasteh and Barhe road was pushed on.

141. In the Ahmednagar Division the building of Forest depôt-houses for storing hirda nuts and accommodating Forest Guards, was commenced at Phopsandi, Ghátghar, Shinganvadi, Pálé, Shirpunje and Koltémbhé.

142. In the Poona Division the construction of a road from Ghodá to Ámbegaon was undertaken by the Public Works Department. This road will connect Ghodá, the chief town in the Ámbegaon Range, with Ámbegaon, 11 miles distant, and will be located in the upper reaches of the valley of the Ghoda river, where the latter flows from the gháts, and will open out teak and mixed forests in the valley and in the neighbourhood of the source of this river. The importance of this road can scarcely be exaggerated, as this part of the country, which has a large trade in Hirda and forest produce, is almost wholly devoid of communications.

143. In the Páñch Maháls Division the Godhrá to Sherá road, which is largely used by the timber trade, was improved; and an office was built for the Range Forest Officer at Dohad. Provision is likewise being made for the accommodation of the Range Forest Office in the Kacheries at Hálol and Kapadvanj now under construction.

144. It will be seen from the above list that the forest interests are benefiting largely from the contribution the forest revenues give to the Provincial Services Budget, and that communications calculated to augment the forest wealth, and at the same time to do good generally to the country at large, are being constantly evolved with great foresight, and are being constructed under skilful professional direction and control.

145. The expenditure incurred from the Forest Budget sanctions during the year under "Roads and Bridges", the works being directed and supervised by Forest officers, amounted to Rs. 739-0-1, and is distributed thus:—

Rs.	a.	p.	
48	9	0	On repairs to the Jawli-Baleshwar road in the Ahmednagar Division.
96	3	6	On repairs to the road from Chachegaon in Karád to Kalgaon in Pátan in the Sátára Division to facilitate the extraction of the teak timber cut in the forests of that neighbourhood,
594	3	7	In the Surat Division on repairs to the road from Bándsa to Dhunda in the Dángs, together with its bridges.
739	0	1	

146. Although the introduction of portable tramways and other agencies, such as artificial water-carriage for the conveyance of timber from forests in rough and inaccessible parts of the country to markets has been under consideration, and although it is possible that a tramway might serve in a high degree the forests of a part of the Dáhnú Range, and of the Talasri Mahál, and it is probable that a tramway might be of great use in the Dangs to bring timber, &c., to the coast markets; and although the improvement of the existing water-carriage, and the excavation of a canal, where the water portorage is now defective, might open out the Syhádrí forests to the Southern Maráthá Railway, for the supply of fuel, the Conservator apprehends that the time has not yet arrived when expenditure upon tramways and water-carriage can be recommended with the certainty of financial advantage in the immediate future, for the Working Plans Division has not yet made sufficient advance, and forest organization and constitution is still very backward, and the forests are also still young.

(b)—BUILDINGS.

147. Buildings to serve as offices for Range Forest Officers have been constructed by the Public Works Department in connection with some Taluka Kacheries in districts, where such accommodation was wanting and no new works of importance except the construction of Forest guards' huts, and repairs to Forest stations and posts were undertaken by Divisional Forest officers at the cost of Forest Budget.

148. The following statement will show the expenditure incurred under his head in the different divisions of the Northern Circle:—

No.	Division.	Amount.
1	North Thána	678 14 0
2	South Thána	411 5 6
3	East Khándesh... ..	291 11 0
4	West Khándesh	893 4 5
5	Násik	3 0 0
6	Ahmednagar	1 0 0
7	Sátára	95 6 0
8	Surat	440 2 2
9	Panch Maháls	252 1 6
	Total ...	3,066 12 7